Public Schools of North Carolina
State Board of Education | Department of Public Instruction

This document is designed to help North Carolina educators teach the Common Core. NCDPI staff are continually updating and improving these tools to better serve teachers.

8th Grade Math Curriculum Crosswalk

The following document is to be used to compare the 2003 North Carolina Mathematics Standard Course of Study and the Common Core State Standards for Mathematics.

As noted in the Common Core State Standards for Mathematics document, the instructional time in Grade 8 should focus on three critical areas:

(1) formulating and reasoning about expressions and equations, including modeling an association in bivariate data with a linear equation, and solving linear equations and systems of linear equations;
(2) grasping the concept of a function and using functions to describe quantitative relationships;
(3) analyzing two- and three-dimensional space and figures using distance, angle, similarity, and congruence, and understanding and applying the Pythagorean Theorem.

To download the Common Core State Standards, please visit http://www.corestandards.org/the-standards.

Important Note: The current SCoS will continue to be the taught and tested standards in the 2010-11 and 2011-12 school years. We expect the new Common Core standards to be taught and assessed in schools for the first time in the 2012-13 school year. That said, we are providing resources now and over the next two-years so that schools and teachers can get a head start on internalizing and planning to teach the new standards.

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
Numbers & Operations	1.01	Develop number sense for the real numbers. a) Define and use irrational numbers. b) Compare and order. c) Use estimates of irrational numbers in appropriate situations.	Number System	8.NS.1	**Know that there are numbers that are not rational, and approximate them by rational numbers.** Understand informally that every number has a decimal expansion; the rational numbers are those with decimal expansions that terminate in 0s or eventually repeat. Know that other numbers are called irrational.	
			Number System	8.NS.2	**Know that there are numbers that are not rational, and approximate them by rational numbers.** Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.*	
			Expressions & Equations	8.EE.2	**Work with radicals and integer exponents.** Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.	
	1.02	Develop flexibility in solving problems by selecting strategies and using mental computation, estimation, calculators or computers, and paper and pencil.				Problem solving is included throughout Common Core.

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
			Expressions & Equations	8.EE.1	**Work with radicals and integer exponents.** Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.*	Moved from Algebra I NC SCOS.
				8.EE.3	**Work with radicals and integer exponents.** Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 × 108 and the population of the world as 7 × 109, and determine that the world population is more than 20 times larger.*	Moved from 6th grade NC SCOS.
				8.EE.4	**Work with radicals and integer exponents.** Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.	Moved from Algebra I NC SCOS.
Measurement	2.01	Determine the effect on perimeter, area or volume when one or more dimensions of two- and three-dimensional figures are changed.				
	2.02	Apply and use concepts of indirect measurement.				

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
			Geometry	8.G.9	**Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.** Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	Volume of cylinders moved from 7th grade NC SCOS. Volume of cones and spheres is new.
Geometry	3.01	Represent problem situations with geometric models.				
	3.02	Apply geometric properties and relationships, including the Pythagorean theorem, to solve problems.	Geometry	8.G.7	**Understand and apply the Pythagorean Theorem.** Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	
	3.03	Identify, predict, and describe dilations in the coordinate plane.		8.G.3	**Understand congruence and similarity using physical models, transparencies, or geometry software.** Describe the effect of dilations**,** translations, rotations, and reflections on two-dimensional figures using coordinates.	Translations, rotations, and reflections are new to 8th grade.
				8.G.1	**Understand congruence and similarity using physical models, transparencies, or geometry software.** Verify experimentally the properties of rotations, reflections, and translations:	New to 8th grade.
					a. Lines are taken to lines, and line segments to line segments of the same length.	
					b. Angles are taken to angles of the same measure.	
					c. Parallel lines are taken to parallel lines.	

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
			Geometry	8.G.2	**Understand congruence and similarity using physical models, transparencies, or geometry software.** Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.	Congruency is addressed in the 7th grade NC SCOS; however, not in terms of transformations.
				8.G.3	**Understand congruence and similarity using physical models, transparencies, or geometry software.** Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	Translations, rotations and reflections are in the 6th grade NC SCOS; dilations are in the 8th grade NC SCOS.
				8.G.4	**Understand congruence and similarity using physical models, transparencies, or geometry software.** Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	Similarity is addressed in the 7th grade NC SCOS; however, not in terms of transformations.
			Geometry	8.G.5	**Understand congruence and similarity using physical models, transparencies, or geometry software.** Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*	Moved from Algebra I NC SCOS.

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
				8.G.6	**Understand and apply the Pythagorean Theorem.** Explain a proof of the Pythagorean Theorem and its converse.	New to 8th grade.
				8.G.8	**Understand and apply the Pythagorean Theorem.** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	Moved from Algebra I NC SCOS.
Data Analysis & Probability	4.01	Collect, organize, analyze, and display data (including scatterplots) to solve problems.	Statistics & Probability	8.SP.1	**Investigate patterns of association in bivariate data.** Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	Clustering, outliers and nonlinear association are new to 8th grade.
	4.02	Approximate a line of best fit for a given scatterplot; explain the meaning of the line as it relates to the problem and make predictions.	Statistics & Probability	8.SP.2	**Investigate patterns of association in bivariate data.** Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	
			Statistics & Probability	8.SP.3	**Investigate patterns of association in bivariate data.** Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*	

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
	4.03	Identify misuses of statistical and numerical data.				
			Statistics & Probability	8.SP.4	**Investigate patterns of association in bivariate data.** Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*	New to 8th grade.
Algebra	5.01	Develop an understanding of function.				
		a) Translate among verbal, tabular, graphic, and algebraic representations of functions.	Functions	8.F.2	**Define, evaluate, and compare functions.** Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*	

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
		b) Identify relations and functions as linear or nonlinear.		8.F.1	**Define, evaluate, and compare functions.** Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.[1]	[1]Function notation is not required in Grade 8.
				8.F.3	**Define, evaluate, and compare functions.** Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.*	
		c) Find, identify, and interpret the slope (rate of change) and intercepts of a linear relation.	Functions	8.F.4	**Use functions to model relationships between quantities.** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	
		d) Interpret and compare properties of linear functions from tables, graphs, or equations.	Expressions &	8.EE.8	**Analyze and solve linear equations and pairs of simultaneous linear equations.** Analyze and solve pairs of simultaneous linear equations.	

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
					a) Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.	
					c) Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*	
	5.02	Write an equation of a linear relationship given: two points, the slope and one point on the line, or the slope and y-intercept.	Functions	8.F.4	**Use functions to model relationships between quantities.** Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x*, *y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	
	5.03	Solve problems using linear equations and inequalities; justify symbolically and graphically.		8.F.4	**Use functions to model relationships between quantities.**	The underlined part of 8.F.4 is moderately aligned with 5.03. Linear inequalities moved to High School common core.

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
					Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (*x*, *y*) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function <u>in terms of the situation it models</u>, and in terms of its graph or a table of values.	
	5.04	Solve equations using the inverse relationships of addition and subtraction, multiplication and division, squares and square roots, and cubes and cube roots.	Expressions & Equations	8.EE.7	**Analyze and solve linear equations and pairs of simultaneous linear equations.** Solve linear equations in one variable.	
					a) Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).	
					b) Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
				8.EE.5	**Understand the connections between proportional relationships, lines, and linear equations.** Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*	New to 8th grade.
			Expressions & Equations	8.EE.6	**Understand the connections between proportional relationships, lines, and linear equations.** Use similar triangles to explain why the slope *m* is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at *b*.	New to 8th grade.
				8.EE.8.b	**Analyze and solve linear equations and pairs of simultaneous linear equations.** Analyze and solve pairs of simultaneous linear equations. b) Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.*	Moved from Algebra I NC SCOS.

NC SCOS			Common Core			
Strand	Objective	Text of objective	Domain	Standard	**Cluster** Text of objective	Comments
			Functions	8.F.5	**Use functions to model relationships between quantities.** Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	New to 8th grade.